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amendments, it is appropriate for claims 3, 5, 9, 10 and 12 to properly depend from claims 13-17.

Claims 5 and 10-14 and 15-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Examiner states that the specification describes only one plant geminivirus replicase polynucleotide that increases endoreduplication and yield.

The Examiner's statement is respectfully traversed. Page 5, lines 1-8 and 11-19 of the present specification disclose various suitable geminivirus useful in increasing endoreduplication and yield. It is presumed that the Examiner is referring to the specific working examples provided in the present application. Although working examples for wheat dwarf virus RepA are provided in the present application, it is respectfully submitted that 35 USC 112 does not require a working example. Further, case law does not require that an application provide a working example. It is only required that the application teach the person skilled in the art how to make and use the invention. The present application meets that requirement. The many items cited in the 1449 IDS statements are representative of the skill in the art with regard to geminivirus.

The present claims require a geminivirus replicase polynucleotide. On page 4, lines 30-33 of the present specification, viral replicase polynucleotides are defined as polynucleotides that express polypeptides that exhibit Rb binding function. Therefore, the claims require a polynucleotide that expresses proteins that exhibit Rb binding function. As discussed in detail below, it is the Rb binding function of Geminivirus that is involved in increasing endoreduplication and yield in a plant.

Gutierrez, DE Jager and Murray disclose that activation of the G1/S transition in plants depends on the retinoblastoma (Rb) control pathway. (C Gutierrez, 1998,

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The retinoblastoma pathway in plant cell cycle and development. *Curr. Opin. Plant Biol.* 1:492-497 (see A9 of applicants IDS filed 9-15-00, Page 495; section entitled "Regulation of G1/S-specific gene expression by Rb-bound transcription factors"); and De Jager SM and Murray JAH, 1999. Retinoblastoma proteins in plants. *Plant Mol. Biol.* 41:295-299, (concept reviewed through entire article, but most succinctly summarized on page 298, Figure 2 and in 3rd paragraph, starting with "It would seem that growth stimulatory...") (copy enclosed with IDS)).

Geminiviruses (Mastreviruses, Begomoviruses or Curtoviruses) encode a replication initiator protein (Rep or replicase). Geminivirus replicase has no DNA polymerase activity and functions only in initiating DNA replication. Polymerase activity is mediated by DNA replication machinery of the host plant cell (KE Palmer and EP Rybicki, 1998, *The Molecular Biology of Mastreviruses*, *Advances in Virus Research*, Vol. 50:183-234 (see page 189, first full paragraph) (copy enclosed with IDS)).

The Mastreviruses (i.e. such as Wheat Dwarf Virus) encode a Rep-type protein referred to as RepA, which contains a recognizable amino acid motif (LxCxE) responsible for binding Rb, a suppressor of the plant cell cycle. Thus stimulating DNA replication within the plant cell. See Gutierrez above.

In the Begomoviruses and Curtoviruses, the encoded Rep proteins do not contain a recognizable LxCxE motif, and yet for example, for the tomato golden mosaic virus, the viral Rep protein was found to bind Rb (Ach RA, Durfee T, Miller AB, Taranto P, Hanley-Bowdoin L, Zambryski PC and Gruissem W, 1997. RRB1 and RRB2 encode maize retinoblastoma-related proteins that interact with a plant D-type cyclin and geminivirus replication protein. *Mol. Cell. Biol.* 17:5077-5086, (see page 5084 Col. 2), (copy enclosed with IDS)).

Therefore, the various geminivirus disclosed in the present application comprise a replication polypeptide that binds Rb and stimulates replication in the cell.

Claims 3, 5-6 and 9-17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for methods for increasing endoreduplication and crop yield by stably transforming a plant with an isolated wheat dwarf virus RepA geminivirus replicase polynucleotide, does not reasonably provide enablement for methods for increasing endoreduplication and crop yield by stably transforming a plant with an isolated plant geminivirus replicase polynucleotide.

As discussed in detail above, the application discloses various geminivirus suitable for increasing endoreduplication and crop yield. A working example is provided in the present specification and a reasoned analysis is provided above for the suitability of various geminivirus for increasing endoreduplication and crop yield. As noted by the Examiner, the Applicant has shown maize and soybean plants transformed with a RepA polynucleotide exhibit increased endoreduplication and increased plant size. This information provides the knowledge necessary for one skilled in the art to make and use the invention as claimed in the present application.

The Examiner notes that Hanley-Bowdoin et al. report that transgenic tobacco plants expressing the TGMV geminivirus replicase are phenotypically normal (page 1450 column 1, last paragraph).

In the same paragraph, Hanley-Bowdoin et al. disclose that the AL1 protein, while being essential for replication, is not by itself a determinant of disease or pathogenesis. It appears that the phenotype Hanley-Bowdoin et al refer to is disease resistance. The AL1 plants did not exhibit disease resistance. Hanley-Bowdoin et al also make the general statement that AL1 does not significantly alter growth and development of plant cells. It is noted that Hanley-Bowdoin et al show no evidence to support the conclusion. Tobacco leaves are large and curly. It would be difficult to determine a change in size without measurement. Also they do not disclose measuring yield. They are interested in studying the biochemical characterization of the replication protein (page 1450 column 1, last paragraph).

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Withdrawal of the 35 U.S.C. 102(e) rejection is noted with appreciation.

In view of the above comments, withdrawal of the outstanding rejections and allowance of the remaining claims is respectfully requested.

Respectfully submitted,



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